

Tsc1 Cas9-KO Strategy

Designer: Huan Fan

Reviewer: Huan Wang

Design Date: 2020-5-26

Project Overview

Project Name

Tsc1

Project type

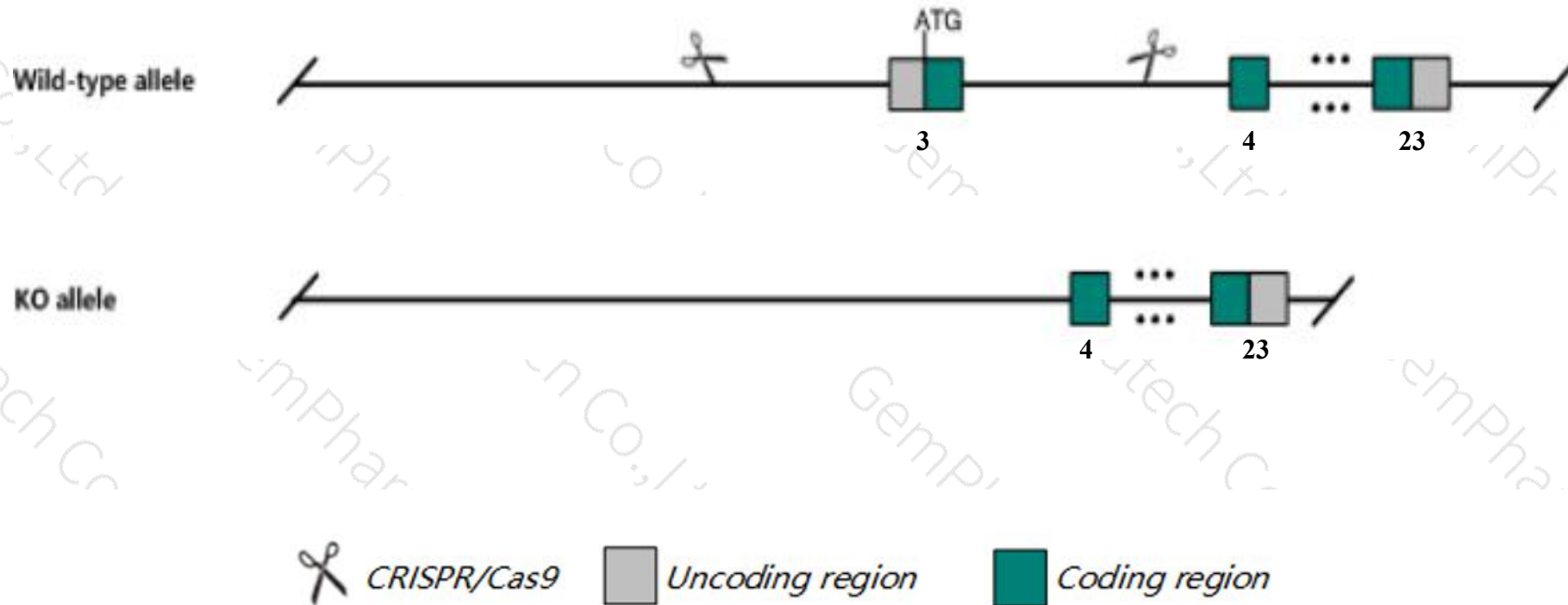
Cas9-KO

Strain background

C57BL/6JGpt

Knockout strategy

This model will use CRISPR/Cas9 technology to edit the *Tsc1* gene. The schematic diagram is as follows:



- The *Tsc1* gene has 11 transcripts. According to the structure of *Tsc1* gene, exon3 of *Tsc1-201* (ENSMUST00000028155.11) transcript is recommended as the knockout region. The region contains start codon ATG. Knock out the region will result in disruption of protein function.
- In this project we use CRISPR/Cas9 technology to modify *Tsc1* gene. The brief process is as follows: CRISPR/Cas9 system w

- According to the existing MGI data, homozygous null mutants show liver hypoplasia, open neural tube and die by embryonic day 10.5-11.5. heterozygotes develop kidney cystadenomas and liver hemangiomas. conditional astrocyte-specific nulls show increased astrocyte numbers and seizures.
- The *Tsc1* gene is located on the Chr2. If the knockout mice are crossed with other mice strains to obtain double gene positive homozygous mouse offspring, please avoid the two genes on the same chromosome.
- This strategy is designed based on genetic information in existing databases. Due to the complexity of biological processes, all risk of the gene knockout on gene transcription, RNA splicing and protein translation cannot be predicted at the existing technology level.

Gene information (NCBI)

Tsc1 TSC complex subunit 1 [Mus musculus (house mouse)]

Gene ID: 64930, updated on 22-Mar-2020

Summary

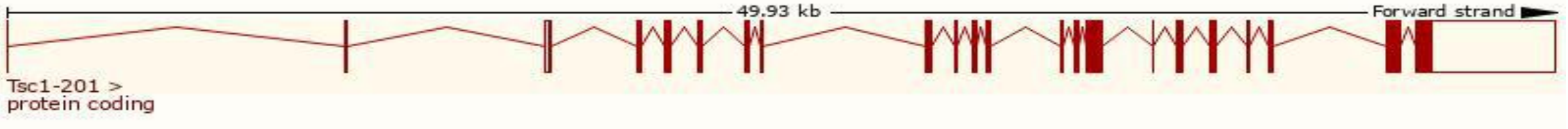
Official Symbol	Tsc1 provided by MGI
Official Full Name	TSC complex subunit 1 provided by MGI
Primary source	MGI:MGI:1929183
See related	Ensembl:ENSMUSG00000026812
Gene type	protein coding
RefSeq status	VALIDATED
Organism	Mus musculus
Lineage	Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Myomorpha; Muroidea; Muridae; Murinae; Mus; Mus
Expression	Ubiquitous expression in CNS E18 (RPKM 10.9), whole brain E14.5 (RPKM 9.8) and 28 other tissues See more
Orthologs	human all

Transcript information (Ensembl)

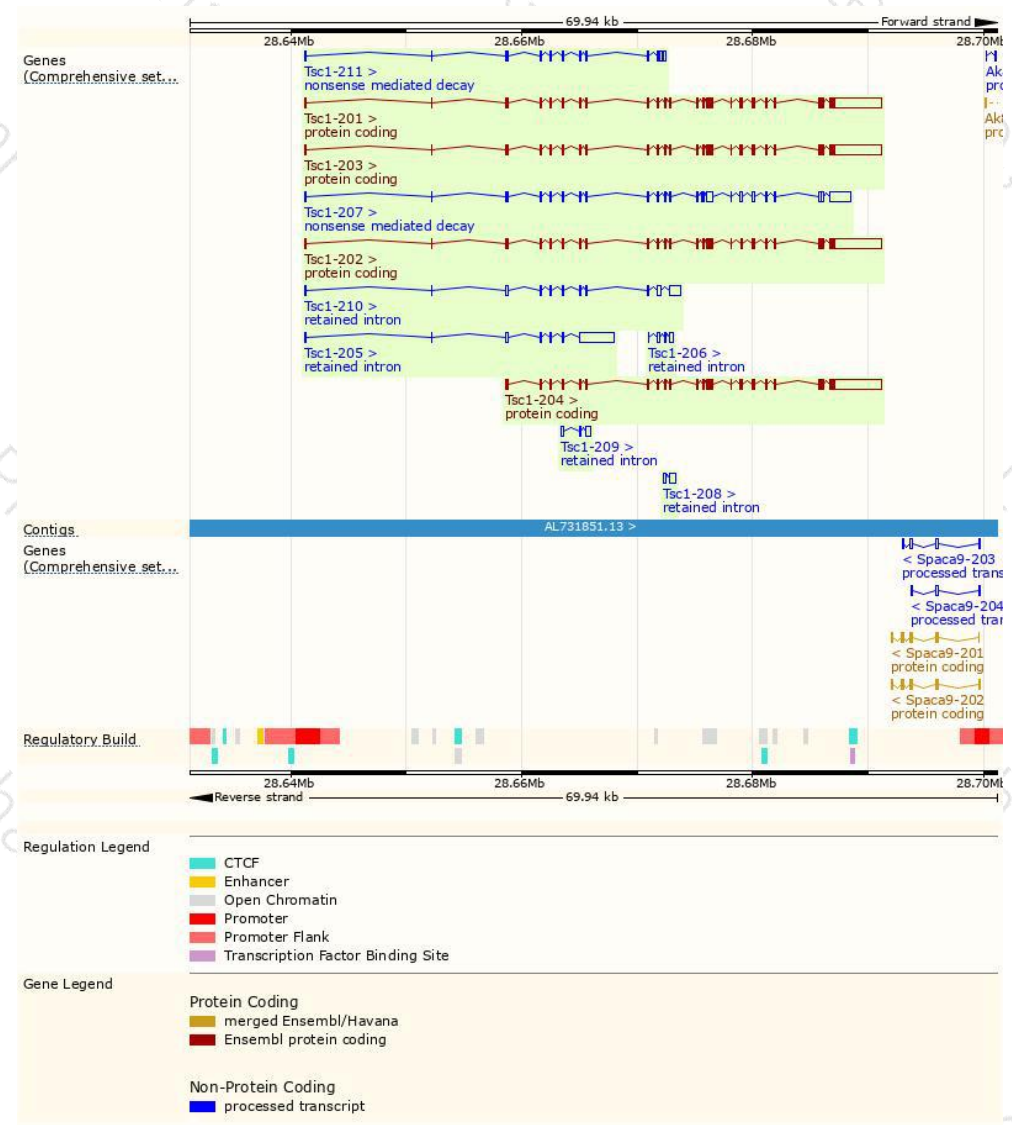
The gene has 11 transcripts,all transcripts are shown below:

Name	Transcript ID	bp	Protein	Biotype	CCDS	UniProt	Flags
Tsc1-203	ENSMUST00000113869.7	7702	1161aa	Protein coding	CCDS79762	Q9EP53	TSL:1 GENCODE basic APPRIS ALT2
Tsc1-202	ENSMUST00000113867.8	7682	1155aa	Protein coding	CCDS71013	Q9EP53	TSL:1 GENCODE basic APPRIS ALT2
Tsc1-201	ENSMUST00000028155.11	7674	1160aa	Protein coding	CCDS15844	Q9EP53	TSL:1 GENCODE basic APPRIS P3
Tsc1-204	ENSMUST00000113870.2	7595	1160aa	Protein coding	CCDS15844	Q9EP53	TSL:1 GENCODE basic APPRIS P3
Tsc1-207	ENSMUST00000133565.7	5103	459aa	Nonsense mediated decay	-	F2Z3X2	TSL:5
Tsc1-211	ENSMUST00000156857.7	1711	368aa	Nonsense mediated decay	-	F2Z3W0	TSL:5
Tsc1-205	ENSMUST00000124507.1	3640	No protein	Retained intron	-	-	TSL:1
Tsc1-210	ENSMUST00000153625.7	2388	No protein	Retained intron	-	-	TSL:1
Tsc1-209	ENSMUST00000150274.1	818	No protein	Retained intron	-	-	TSL:3
Tsc1-208	ENSMUST00000139642.1	772	No protein	Retained intron	-	-	TSL:2
Tsc1-206	ENSMUST00000125715.1	703	No protein	Retained intron	-	-	TSL:3

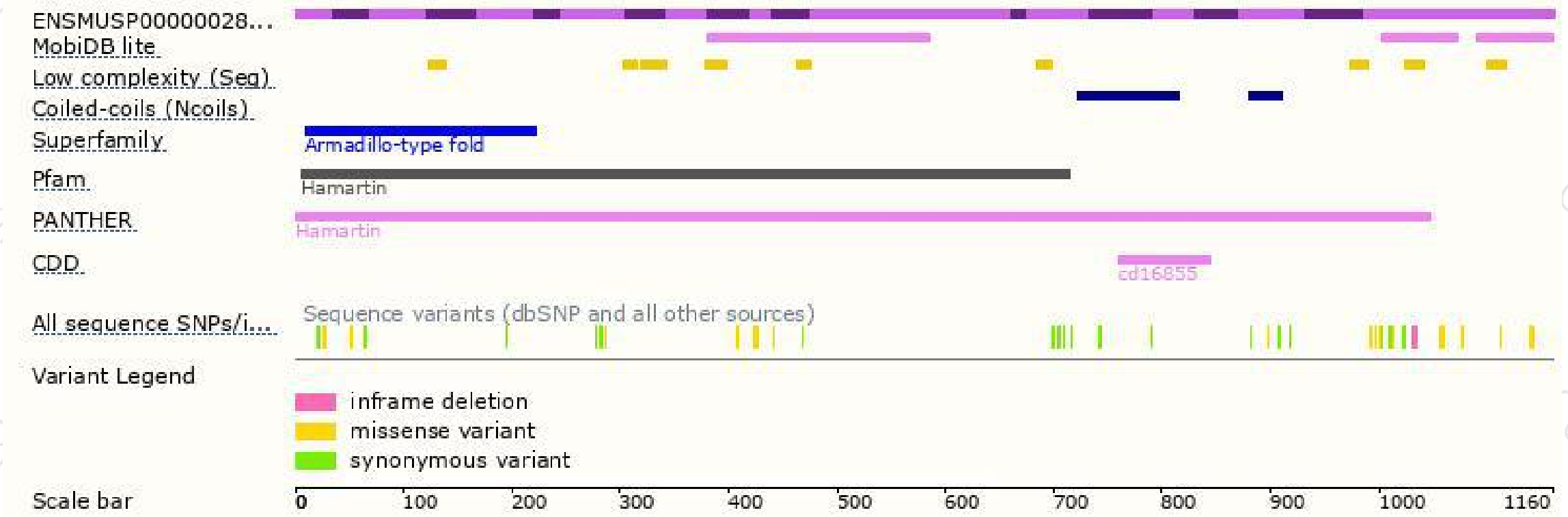
The strategy is based on the design of *Tsc1-201* transcript,the transcription is shown below:



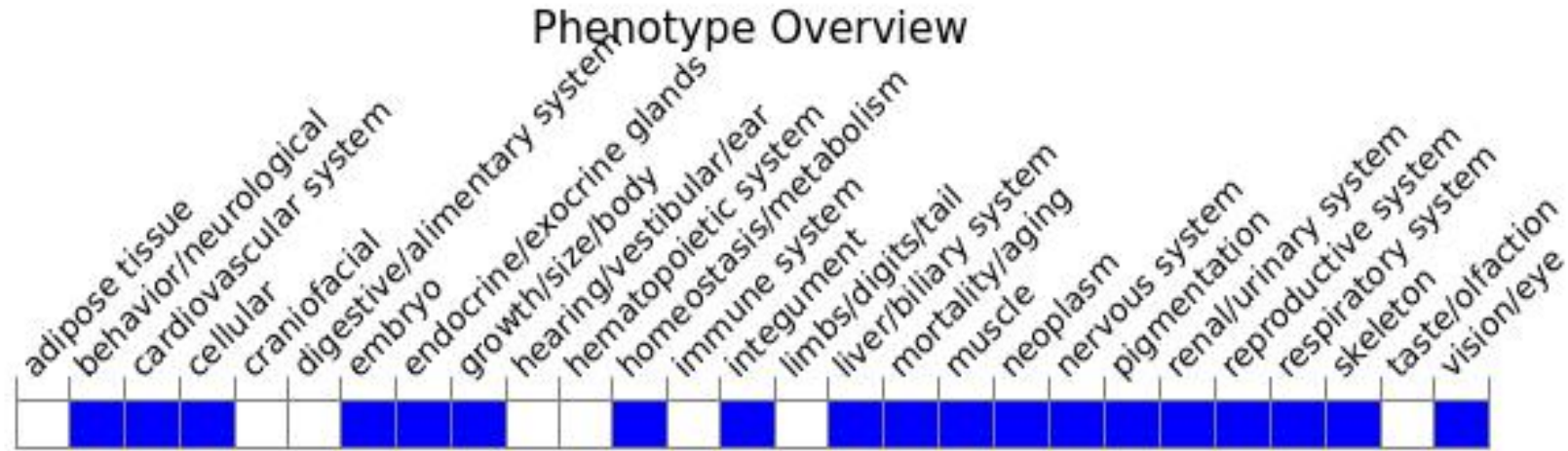
Genomic location distribution



Protein domain



Mouse phenotype description(MGI)



Phenotypes affected by the gene are marked in blue. Data quoted from MGI database(<http://www.informatics.jax.org/>).

According to the existing MGI data, homozygous null mutants show liver hypoplasia, open neural tube and die by embryonic day 10.5-11.5. Heterozygotes develop kidney cystadenomas and liver hemangiomas. Conditional astrocyte-specific nulls show increased astrocyte numbers and seizures.

If you have any questions, you are welcome to inquire.

Tel: 400-9660890

